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TECHNICAL LETTER NASA-24

U.S. Geological Survey
Department of the Interior



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON, D.C. 20242

Technical Letter
NASA-24
May 1966

Dr. Peter C. Badgley
Chief, Natural Resources Program
Office of Space Science and Application
Code SAR, NASA Headquarters
Washington, D.C. 20546

Dear Peter:

Transmitted herewith are 3 copies of:

TECHNICAL LETTER NASA-24
PHOTOGEOLOGIC INTERPRETATION OF GEMINI IV
COLOR PHOTOGRAPHY: BAJA, CALIFORNIA*

by

Rowland Tabor**

Sincerely yours,

William A. Fischer
Research Coordinator for
USGS/NASA Natural Resources Program

*Work performed under NASA Contract No. R-09-020-015
**U.S. Geological Survey, Menlo Park, California

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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May 1966

These data are preliminary and should
not be quoted without permission

Prepared by the Geological Survey
for the National Aeronautics and
Space Administration (NASA)

*Work performed under NASA Contract No. R-09-020-015
**U.S. Geological Survey, Menlo Park, California

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PHOTOGEOLOGIC INTERPRETATION OF GEMINI IV

COLOR PHOTOGRAPHY: BAJA, CALIFORNIA

by

Rowland Tabor

Introduction

The color photographs from Gemini IV were taken with a hand held Hasselblad camera with a focal length of 80 mm (f 2.8). The space vehicle was about 180 miles above the surface of the earth when passing over Baja, California and the photographic prints, used in this study, have a scale of about 1:640,000.

The photograph selected for the study (fig. 1) is essentially vertical, has no obscuring clouds and is centered over a desert area in Baja, California. Geologic features are well displayed.

Making the Interpretive Map

Conventional photogeologic methods were employed to convert the photograph into a geologic map (fig. 2). The major rock units were traced directly from the photograph, but the interpretation was made with a stereopair under magnification.

Evaluation of the Interpretation

The writer has no specific knowledge of the geology of Baja, California, and the units were named after comparing the interpretive map with the Geologic Map of North America (scale 1:5,000,000 1965 ed.) and a geologic map by C.H. Beal (Geol. Soc. America Memoir 31, pl. 1, 1948). P.B. King of the U.S. Geological Survey identified the Aqua Blanca fault on the photograph. According to the reference maps the gross picture of young volcanic rock overlying the eastern edge of a granitic highland is correct. The coloring, stratification and rubbly weathering debris strongly suggest the presence of the volcanic rocks and the massiveness, jointing and color of the granitic rocks give clue to their identity. Because the structural surface is still present locally on the red volcanic rocks, some tectonic structures can be identified.

The steeply dipping bedded rocks are not shown at all on the reference maps, but Beal indicates bedded sedimentary rocks are present in the outcrop area shown as granitic on the north edge of the map, just west of the Colorado River.

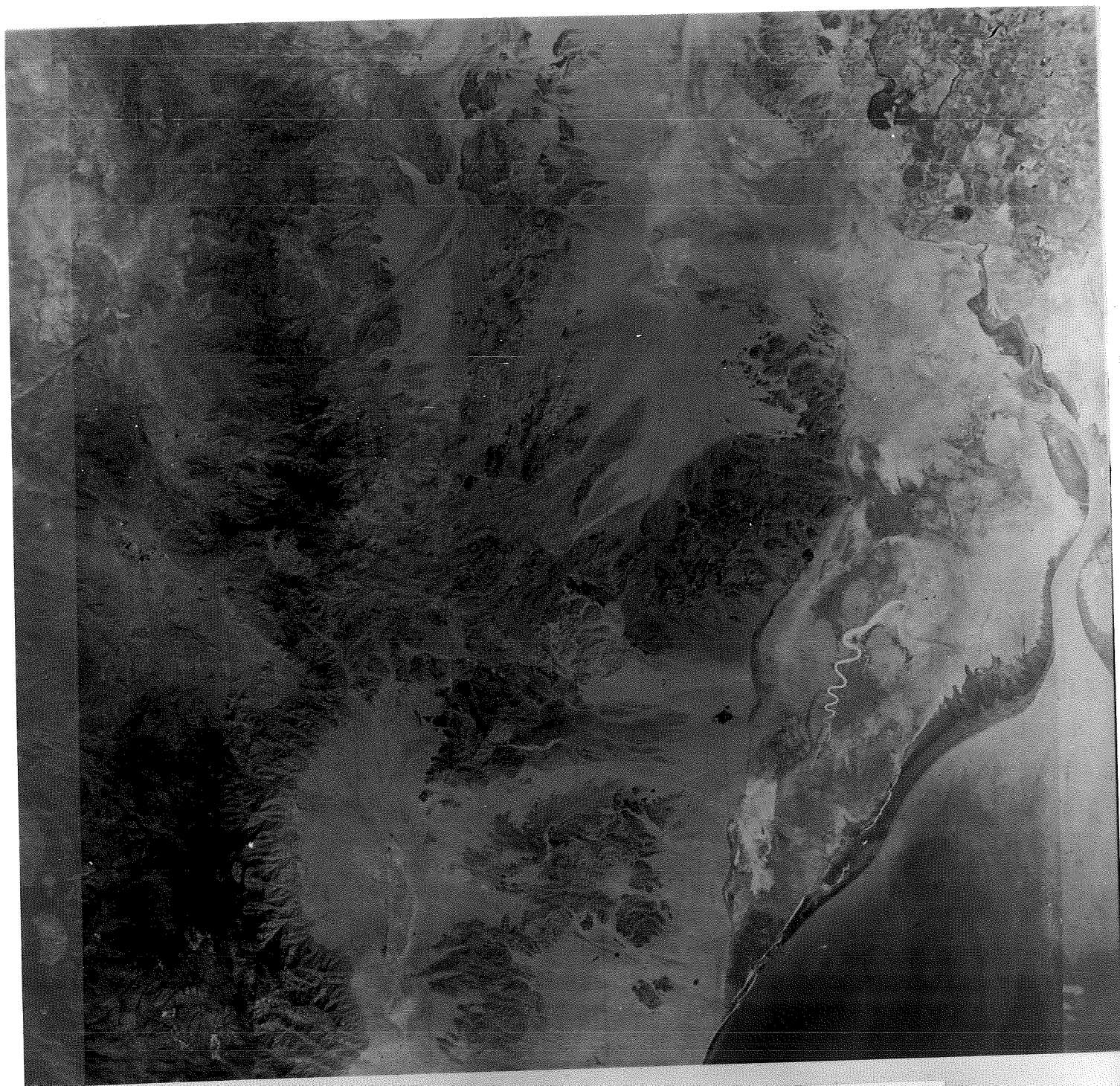
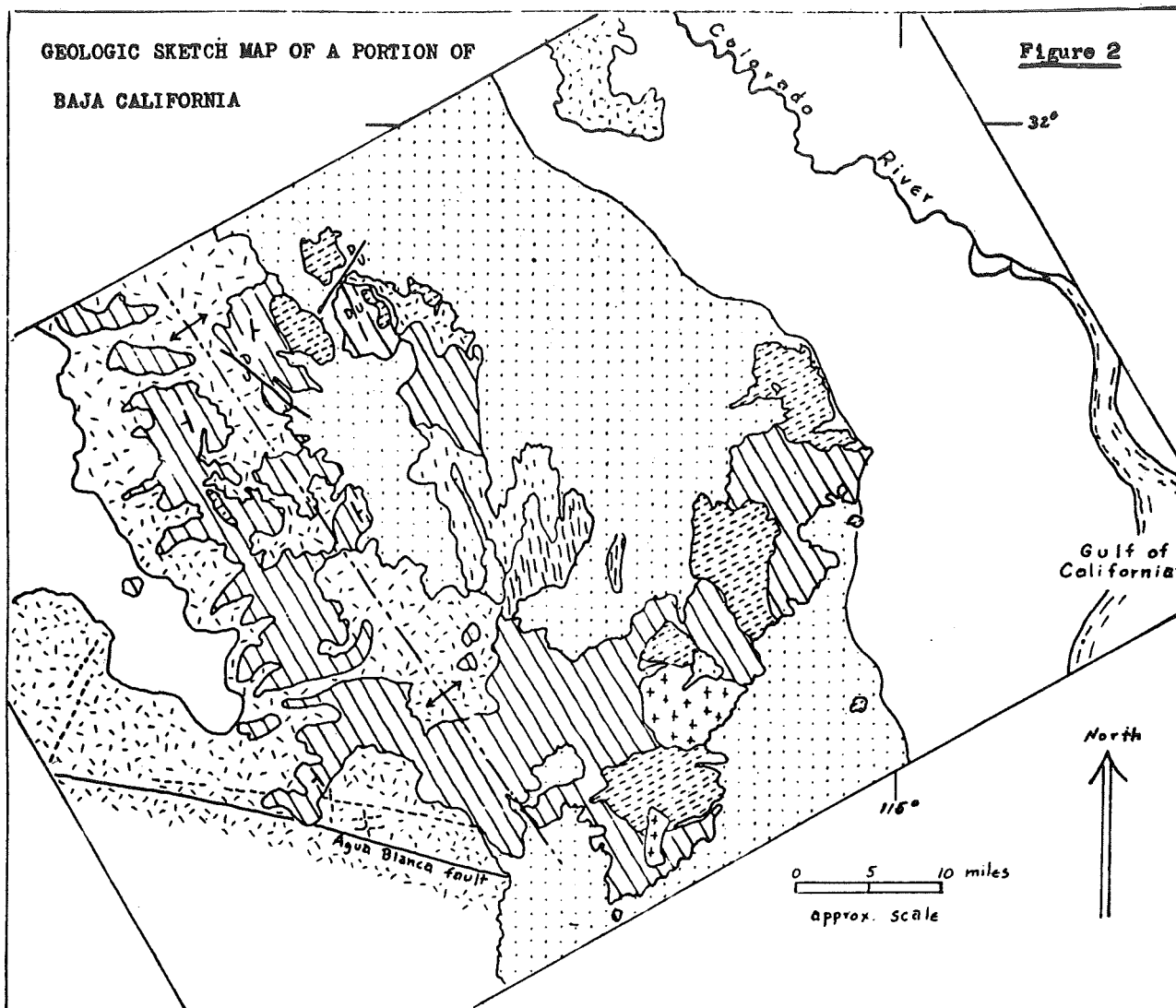


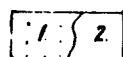
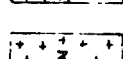
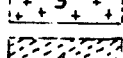
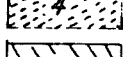
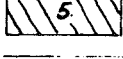
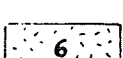
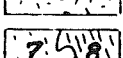




Figure 1. Gemini photograph of a portion of Baja, California.

GEOLOGIC SKETCH MAP OF A PORTION OF
BAJA CALIFORNIA

Figure 2



Explanation

- | | |
|---|---|
|  | 1. Wind blown sand (minor alluvium) |
|  | 2. Alluvium. Includes littoral marine sediments in Gulf area. |
|  | 3. White sulfatized volcanic rock or intrusive rock. |
|  | 4. Dark volcanic rock. Generally overlies red volcanic rock but in area to east, age relations unknown. |
|  | 5. Red volcanic rock, locally coarsely jointed. Underlain by thin white tuff (?). |
| <hr style="border-top: 1px dashed black;"/> | |
|  | 6. Grey granitoid rock, coarsely jointed. |
|  | 7,8. Steeply dipping layered rocks, either sedimentary or metamorphic. |
| | 7 light colored; 8 dark colored. |
-
- | | | | |
|---|---|---|---|
|  |  |  |  |
| Strike and dip
in volcanic rock | Fault | Joint in
granitoid rock | Fold axis |